Selected Abstracts from the December Issue of the European Journal of Vascular and Endovascular Surgery

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Safety of Carotid Endarterectomy After Intravenous Thrombolysis for Acute Ischaemic Stroke: A Case-Controlled Multicentre Registry Study

Rathenborg L.K., Venermo M., Troëng T., Jensen L.P., Vikatmaa P., Wahlgren C., Ijäs P., Björck M., Kragsterman B. Eur J Vasc Endovasc Surg 2014;48:620-5.

Objective: Few studies have been published on the safety of carotid endarterectomy (CEA) after intravenous thrombolysis (IVT). Registry reports have been recommended in order to gather large study groups.

Design: A retrospective, registry based, case controlled study on prospectively gathered data from Sweden, the capital region of Finland, and from Denmark, including 30 days of follow up.

Methods: The study group was a consecutive series of 5526 patients who had CEA for symptomatic carotid artery stenosis during a 4.5 year period. Among these, 202 (4%) had IVT prior to surgery, including 117 having CEA within 14 days, and 59 within 7 days of thrombolysis. IVT as well as CEA were performed following established guidelines. The median time from index symptom to CEA was 12 days (range 0–130, IQR 7–21).

Results: The 30 day combined stroke and death rate was 3.5% (95% CI 1.69–6.99) for those having IVT + CEA, 4.1% (95% CI 3.46–4.39) for those having CEA without previous IVT (odds ratio 0.84 [95% CI 0.39–1.81]), 3.4% (95% CI 1.33–8.39) for those having IVT + CEA within 14 days, and 5.1% (95% CI 1.74–13.91) for those having IVT + CEA within 7 days.

Conclusion: Data on the time from symptoms to CEA in patients not having IVT, Rankin score, degree of stenosis, and cerebral imaging were not available. Despite its weaknesses, this study reasserts that CEA can be performed within the recommended 2 weeks of the onset of symptoms and IVT without increasing the risk of peri-operative stroke or death. Centres and vascular registries are recommended to continue monitoring changes in patient characteristics, lead times, and major complications after CEA in general, with a special focus on those who have undergone a prior thrombolysis.

Outcomes of Fenestrated/Branched Endografting in Post-dissection Thoracoabdominal Aortic Aneurysms

Oikonomou K., Kopp R., Katsargyris A., Pfister K., Verhoeven E.L., Kasprzak P. Eur J Vasc Endovasc Surg 2014;48:641-8.

Objectives: Fenestrated/branched thoracic endovascular repair (F/Br-TEVAR) is increasingly applied for atherosclerotic thoracoabdominal aortic aneurysm (TAAA); however, use in post-dissection TAAAs is still very limited. Experience with F/Br-TEVAR in the treatment of post-dissection TAAA is presented.

Methods: Data were analysed from prospectively maintained databases including all patients with post-dissection TAAAs that underwent F/Br-TEVAR within the period January 2010 to July 2013 in two vascular institutions. Evaluated outcomes included initial technical success, operative mortality and morbidity, late survival, endoleak, aneurysm diameter regression, renal function, and reintervention during follow-up (FU).

Results: A total of 31 patients (25 male, mean age 65 ± 11.4 years) were treated. Technical success was 93.5% and 30-day mortality 9.6%. Temporary spinal cord ischaemia occurred in four (12.6%) patients, with no case of permanent paraplegia. Mean FU was 17.0 ± 10 months. There were seven late deaths, all aneurysm unrelated. Estimated overall survival rates were 83.9 ± 6.7, 76.4 ± 7.9 and 71.6 ± 8.7% at 6, 12, and 18 months, respectively. Impairment of renal function occurred in two (6.4%) patients. Endoleaks were diagnosed in 12 patients during FU, including six type IB endoleaks and six type II endoleaks. Reintervention was required in seven (22.5%) patients. Mean aneurysm sac regression was 9.3 ± 8.7 mm, with a false lumen thrombosis rate of 66.7% and 88.2% for patients with a FU longer than 6 and 12 months respectively.

Conclusions: F/Br-EVAR is feasible for patients with a post-dissection TAAA. Although associated with additional technical challenges, and a significant need for reintervention, it leads to favourable aneurysm morphologic changes, and may play a more prominent role in the future for this type of pathology if long-term results confirm the good initial outcome.

Low Post-operative Mortality after Surgery on Patients with Screening-detected Abdominal Aortic Aneurysms: A Swedvasc Registry Study

Linné A., Smidfelt K., Langenskiöld M., Hultgren R., Nordanstig J., Kragsterman B., Lindström D. Eur J Vasc Endovasc Surg 2014;48:649-56.

Objectives: Screening for abdominal aortic aneurysms (AAAs) substantially reduces aneurysm-related mortality in men and is increasing worldwide. This cohort study compares post-operative mortality and complications in men with screening-detected vs. non-screening-detected AAAs.

Methods: Data were extracted from the Swedish National Registry for Vascular Surgery (Swedvasc) for all screening-detected men treated for AAA (n = 350) and age-matched controls treated for non-screening-detected AAA (n = 350).

Results: There were no differences in baseline characteristics besides age, which was lower in the screening-detected group than in the non-screening-detected group (median 66 vs. 68, $p < .001$). Open repair was used more frequently than endovascular aortic repair (EVAR) in patients with screening-detected AAAs than in non-screening-detected controls (56% vs. 45% $p = .005$). No differences in major post-operative complications at 30 days were observed between the groups. In patients treated with open repair there were no differences in 30-day, 90-day or 1-year mortality in screening-detected patients compared to non-screening-detected controls (1.0% vs. 3.2% $p = .25$, 2.1% vs. 4.5% $p = .23$, 4.1% vs. 5.8% $p = .61$). None of the patients treated with EVAR in either group died within 30 days. The 90-day mortality after EVAR was lower in patients with screening-detected AAA than in those with non-screening-detected AAAs (0.0% vs. 3.1%, $p = .04$). No difference in the 1-year mortality was detected in the EVAR-patients between the two groups (1.4% vs. 4.7%, $p = .12$).

Conclusions: The contemporary post-operative mortality after AAA surgery was low in this national audit of patients with screening-detected AAAs and age-matched controls. Patients with screening-detected AAAs have the same frequency of complications at 30 days as patients with non-screening-detected AAA. This study gives further support to national screening programs for the detection of AAA in men.

Abdominal Aortic Diameter Is Increased in Males with a Family History of Abdominal Aortic Aneurysms: Results from the Danish VIVA-trial

Joergensen T.M.M., Houlind K., Green A., Lindholt J.S. Eur J Vasc Endovasc Surg 2014;48:669-75.

Objective: To investigate, at a population level, whether a family history of abdominal aortic aneurysm (AAA) is independently related to increased aortic diameter and prevalence of AAA in men, and to elucidate whether the mean aortic diameter and the prevalence of AAA are different between participants with male and female relatives with AAA.

Design: Observational population-based cross-sectional study.

Materials: 18,614 male participants screened for AAA in the VIVA-trial 2008 –2011 with information on both family history of AAA and maximal aortic diameter.

Methods: Standardized ultrasound scan measurement of maximum antero-posterior aortic diameter. Family history obtained by questionnaire. Multivariate regression analysis was used to test for confounders: age, sex, smoking, comorbidity and medication.

Results: From the screened cohort, 569 participants had at least one first degree relative diagnosed with AAA, and 38 had AAA. Participants with a family history of AAA (+FH) had a significantly larger mean maximum aortic diameter (20.50 mm) compared with participants without family history of AAA (–FH) (19.07 mm, $p < .0001$), and +FH with female relatives with AAA had significantly larger mean maximum aortic diameter

(21.8 mm) than +FH with male relatives (19.9 mm, $p = .007$). Furthermore the prevalence of AAA was significantly higher among +FH (6.7%) compared with −FH (3.0%) with an odds ratio (OR) of 2.2 (95% CI: 1.6 to 3.2, $p < .001$) and +FH with female relatives with AAA had a more than two and a half times increased prevalence of AAA compared with +FH with male relatives with AAA with an OR of 2.65.

Conclusions: First-degree male relatives of AAA patients have wider aortas and a twofold higher prevalence of AAA compared with the age adjusted background population. The prevalence of AAA was markedly higher in participants related to female, rather than male, patients with AAA.

Abdominal Aortic Aneurysms with High Thrombus Signal Intensity on Magnetic Resonance Imaging are Associated with High Growth Rate

Nguyen V.L., Leiner T., Hellenthal F.A.M.V.I., Backes W.H., Wishaupt M.C.J., van der Geest R.J., Heeneman S., Kooi M.E., Schurink G.W.H. Eur J Vasc Endovasc Surg 2014;48:676-84.

Objectives: A layer of intraluminal thrombus is commonly observed in abdominal aortic aneurysms (AAAs). The purpose of this study was to investigate whether AAAs with high thrombus signal intensity (SI) at T1-weighted (T1w) magnetic resonance imaging (MRI) exhibit a faster aneurysm growth rate.

Methods: This was a prospective follow-up study. Patients with a small AAA underwent MRI examinations at 6 month intervals. Aneurysm thrombus and psoas muscle SI at the point of maximal diameter on T1w images were measured and expressed as a ratio (thrombus SI/muscle SI). Based on these measurements, patients were categorized into three groups: AAA with relative thrombus SI above (group A) and below (group B) the mean relative thrombus SI of 1.20. Patients with AAA without thrombus constituted group C. Eight patients were scanned twice within 2 weeks to investigate scan−rescan reproducibility. Aneurysm growth rates were expressed as the change in maximal cross sectional area (cm^2).

Results: A total of 35 patients (m/f: 26/9; age 72 ± 7 years; AAA maximal diameter 4.9 ± 0.5 cm) were included. Mean aneurysm growth rate for patients in group A ($n = 11$, 1.87 cm^2/0.5 year) was two-fold higher than group B ($n = 17$, 0.78 cm^2/0.5 year, $p = .005$) and eight-fold higher than group C ($n = 7$, 0.23 cm^2/0.5 years, $p = .004$) at 6 months' follow-up. At 12 months' follow-up, the mean aneurysm growth rate remained significantly higher in group A ($n = 7$, 3.03 cm^2/year) than groups B ($n = 10$, 1.63 cm^2/year, $p = .03$) and C ($n = 7$, 0.73 cm^2/year, $p = .004$). The reproducibility for thrombus SI measurements was found to be high with a coefficient of variation of 6.2%. Aneurysm maximal cross-sectional area at baseline was not significantly different for the three groups.

Conclusions: Abdominal aortic aneurysms with high thrombus SI on T1w MR images are associated with higher aneurysm growth rates.

Association Between Salivary Cotinine and Cardiovascular Biomarkers Among Nonsmokers and Current Smokers: Cross-sectional Study of 10,081 Participants

Lu L., Mackay D.F., Newby D.E., Pell J.P. Eur J Vasc Endovasc Surg 2014;48:703-10.

Objective: Both active smoking and exposure to secondhand smoke (SHS) are associated with cardiovascular disease, but sidestream smoke contains higher levels of small particles and toxic gases than mainstream smoke. The relationship between the concentration of cotinine and a number of cardiovascular biomarkers among nonsmokers and active smokers was examined.

Methods: A cross-sectional study using the Scottish Health Surveys conducted between 1998 and 2010 was undertaken. Inclusion was restricted to participants aged ≥16 years who had provided saliva and blood samples. Uni- and multivariate regression models were used to examine the relationships between the concentration of cotinine and C-reactive protein (CRP), high-density lipoprotein (HDL) cholesterol, and fibrinogen concentrations, as well as total:HDL cholesterol ratios.

Results: Of the 10,018 eligible participants, 7,345 (73.3%) were confirmed to be nonsmokers (cotinine <15.0 ng/mL) and 2,673 (26.7%) were confirmed to be current smokers (cotinine ≥15.0 ng/mL). CRP and total:HDL cholesterol increased, and HDL cholesterol decreased, with increasing cotinine concentration across nonsmokers and smokers (all $p < .001$). However, there were step changes at the interface, whereby nonsmokers with a high exposure to SHS had lower concentrations of cotinine than light active smokers but comparable concentrations of CRP ($p = .709$), HDL cholesterol ($p = .931$), and total:HDL cholesterol ($p = .405$). Fibrinogen concentrations were significantly raised in moderate and heavy active smokers only (both $p < .001$).

Conclusion: Exposure to SHS is associated with disproportionately higher biomarkers of cardiovascular risk compared with active smoking. Protection from exposure to SHS should be a public health priority.